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Non-Provisional Application of:

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for:

Inter-Folded Sheet Dispenser with Replaceable Cartridge

INTER-FOLDED SHEET DISPENSER WITH REPLACEABLE CARTRIDGE

Claim for Priority

This non-provisional application claims the benefit of the filing date of U.S. Provisional Patent Application Serial No. 60/446,293, of the same title, filed February 10, 2003.

Technical Field

The present invention relates generally to dispensers for inter-folded sheet. More particularly, the invention is directed in a preferred embodiment to a dispensing system including a cartridge with a stack of inter-folded food service sheets secured to a generally planar rectangular core by way of shrink wrap.

Background of Invention

Dispensers for inter-folded sheet are known in the art. There is shown, for example, in United States Patent Application No. 6,213,345 to *Plank* a pop-up tissue dispenser including a replaceable clip of tissues which are dispensed through an aperture generally perpendicular to the axis of the roll of sheets. It is noted in the '345 patent that the clips of tissues could be available as single pre-packaged units wrapped in a thin plastic film or shrink wrap to maintain the proper tissue interleaving pattern and orientation. *See* Column 3, lines 47-54.

There is disclosed in United States Patent Application No. 6,202,889 and 6,349,525, both to *Veith*, an upright facial tissue carton with a top wall, four side-walls, and a bottom wall. The top wall has an aperture formed through which tissue can be withdrawn. Tissue is provided to the dispenser in the form of an inverted U-shaped clip of inter-folded tissue positioned within the carton. Other dispensing systems for inter-folded sheet material and the like may be found in the following: United States Patent No. 2,005,490 to *Baxter*; United States Patent No. 2,195,622 to *Fourness et al.*; United States Patent No. 3,209,941 to

Krake; United States Patent No. 3,265,241 to *McColgan*; United States Patent No. 3,369,700 to *Nelson*; United States Patent No. 3,456,844 to *Planner*; United States Patent No. 3,456,843 also to *Planner*; United States Patent No. 3,700,138 to *Nelson*; and United States Patent No.5,462,197 to *Pound*, all of which patents disclose various features in connection with dispensing sheet products.

Summary of Invention

There is provided in accordance with the present invention a dispenser for dispensing inter-folded sheet which includes a dispenser housing and a replaceable cartridge of inter-folded sheet. Generally speaking, the dispenser housing includes a base wall, two lateral walls, a front wall and a back wall as well as an upper dispensing wall provided with a dispensing aperture. Typically the lateral sidewalls have support means such as channels or a like means for engaging the dispenser cartridge of the dispensing system.

In preferred embodiments, the dispenser is provided with a spring to maintain the sheets in proximity with the dispensing aperture, and the lid and walls of the dispenser are shaped to facilitate loading and removal of a cartridge. This latter characteristic is achieved by providing "low profile" front and back walls. There is optionally provided adapter plates to configure a dispenser to accommodate cartridges of different sizes.

The dispensing cartridge preferably includes a medial support member as well as a folded stack of inter-folded sheets disposed thereabout and retained in position by a retaining member which may be of any suitable construction but preferably is a shrink wrap envelope. The support member may be any longitudinally extending structure capable of providing vertical support to the folded stack of inter-folded sheets about the innermost fold in the stack when the stack is in the housing on the support member and engages the support means found in the lateral walls of the housing. For example, the support member may be a U, V, rod or tubular shaped support member or, more preferably, a

rectangular, generally planar, core member as described and illustrated hereinafter. In a preferred embodiment the dispenser cartridge includes a generally planar rectangular core defining an upper core edge, a lower core edge and two lateral edges. A stack of inter-folded sheets is wrapped about the upper edge of the generally planar rectangular core in a U-shape, the stack and core being sized such that the lateral edges of the core preferably extend outwardly from the U-shaped stack a predetermined distance. A shrink wrap envelope about the stack secures the U-shaped stack of inter-folded sheets about the core and is provided with a dispensing line or lines of weakness providing a dispensing region generally parallel to the upper edge of the core. The inter-folded sheets are secured about the core such that their tail edges are generally parallel with the surface of the dispensing region of the envelope. This cartridge is placed in the dispenser housing including a base, two lateral walls, a front wall, a back wall and an upper dispensing wall provided with a dispensing aperture wherein the lateral sidewalls have support means for engaging the lateral edges of the rectangular core extending from the U-shaped stack of inter-folded sheets. The lateral wall support means are configured to support the cartridge such that the dispensing region of the shrink wrap envelope is presented to the dispensing aperture. In such embodiments, the lower edge of the core optionally extends outwardly from the stack of U-shaped sheets secured thereto and the base wall of the housing has a channel which secures the lower edge of the core of the cartridge when the cartridge is placed therein. The support channels of the housing help keep the shrink wrap in place and are operative to maintain the stack in proper interleaved configuration. Generally speaking, three edges of the generally planar rectangular core extend beyond the U-shaped stack of inter-folded sheets attached thereto a distance of anywhere from about 1/16" to about ½". A typical distance is from about 1/8" to about ¼" so that there is sufficient distance to easily lockingly engage support channels in the dispenser housing to secure the cartridge in place. The cartridge is preferably secured so that the dispensing region of the cartridge is coincident with or adjacent to the dispensing aperture of the dispenser housing.

Typically, the shrink wrap envelope has a perforate line to define the dispensing region. Further included may be a band securing the U-shaped stack about the core, the band is in addition to the shrink wrap generally securing the U-shaped stack about the core. The band preferably has a perforated area to make it easier to tear so as to release the sheet.

In a preferred embodiment the stack of inter-folded sheets is a stack of single fold inter-folded sheet and in preferred embodiments is a stack of inter-folded single fold food service sheets. Such sheets may have any suitable size, for example, typical sizes for rectangular sheets are: 6" x 10¾", 8" x 10¾", 10" x 10¾", 12" x 10¾" or 15" x 10¾".

In another aspect of the invention there is provided a method of dispensing a stack of inter-folded sheets including providing a dispenser cartridge of the type described above and securing the cartridge in a dispenser housing having support means configured to engage the edges of the medial support member of the inter-folded sheet cartridge. In the method of the invention the shrink wrap envelope remains in place between the core and support channels of the dispenser. After the cartridge is positioned, a dispensing line of weakness in the envelope is fractured to form a dispensing region and the sheets are withdrawn from the stack therethrough. The present invention has many advantages, for example, the support core will hold the stack of sheets upwardly adjacent to the dispensing aperture as the stack is depleted. Moreover, since food service sheets such as bakery tissue are very resilient and have surfaces with a relatively low coefficient of friction, the shrink wrap is needed to maintain the proper stack configuration particularly as the stack nears depletion. The shrink-wrap holds the stack in place and operates to hold the sheets in their U-shape thus saving countertop space as will be appreciated by one of skill in the art. These and other advantages of the invention will be readily apparent from the discussion which follows.

Brief Description of Drawings

The invention is described in detail below with reference to the drawings wherein like numbers designate similar parts and wherein:

Figure 1 is a view in perspective, partially in phantom lines, showing a dispenser configured in accordance with the present invention provided with a replaceable cartridge of inter-folded bakery sheets folded about a rectangular stack support;

Figure 2 is a view in perspective of an inter-folded sheet cartridge of the type shown in **Figure 1**;

Figure 3 is an end view in elevation illustrating the cartridge of inter-folded sheets shown in **Figure 2**;

Figure 4 is a side view in elevation of the cartridge of inter-folded sheets shown in **Figures 2** and **3**;

Figure 5 is a view in perspective showing the inventive sheet dispenser of **Figure 1** in operation;

Figure 6 is a diagram illustrating the geometry of the dispensing aperture of the inventive dispenser;

Figure 7 is a schematic view showing a stack of inter-folded sheets in a single fold configuration being prepared for folding about a generally planar support member in accordance with the invention;

Figure 8 is a view in perspective of another dispenser configured in accordance with the present invention;

Figure 9 is an enlarged detail showing an adapter plate; and

Figure 10 is a view in perspective of yet another dispenser configured in accordance with the present invention.

Detailed Description

The invention is described in detail below with reference to several embodiments. Such exemplification is for purposes of explanation and discussion only and is not intended to limit in any way the scope of the invention which is defined solely in the appended claims. Referring generally to **Figures 1, 2, 3, 4, 5** and **6**, there is shown a dispenser **10** configured in accordance with the present invention. Dispenser **10** includes a dispenser housing **11** provided with a replaceable cartridge of inter-folded sheets **12**. Housing **11** includes a front wall **14**, a back wall **16**, sidewalls **18** and **20** as well as a lid **22**. Lid **22** is secured to the remainder of the housing by way of a hinge **24** which is provided to open and close the housing as necessary in order to replace cartridge **12** as needed. Lid **22** also includes an elongated dispensing aperture **26** which is generally elongated and extends along its central axis between sidewalls **18** and **20** as shown in the **Figure**. Housing **11** also includes a base wall **28** indicated on **Figure 1** in dashed lines.

Cartridge **12** is better illustrated in **Figures 2, 3** and **4**. **Figure 2** is a view in perspective of a cartridge configured in accordance with the present invention, while **Figures 3** and **4** are end views and side views in elevation respectively of cartridge **12**. Cartridge **12** includes a stack of inter-folded sheets **30** wrapped around a central core **32** and secured in place by a shrink wrap envelope **34** as well as a paper band **36** as shown in the various diagrams. Band 36 preferably includes a perforate region indicated at 37 to facilitate rupturing.

Shrink wrap envelope **34** includes a perforate line **38** at the upper edge of the cartridge as is seen in **Figure 1, 2** and **3** along the stack generally parallel to

the dispensing or tail edges of the sheets. As illustrated, the dispensing region is defined by perforate line **38** and includes the surface of the shrink wrap envelope in the area which is fractured so that sheets can be withdrawn from the stack at that portion. The dispensing region may be defined by a single perforate line, a perforate elongated rectangle, elongated oval or the like, all of which have their longitudinal axis generally parallel to line **38** such that the surface of the dispensing region is generally parallel to the tails of the sheets to be dispensed. The dispensing region of the envelope is generally parallel to the tails of the sheets to be dispensed in that the edges **40** of the sheets are aligned with the longitudinal axis of the dispensing region (line **38** in **Figures 1, 2, 3**) as opposed to perpendicular to that axis as would be the case with a pop-up tissue dispenser, for example. The stack of inter-folded sheets **30** is in preferred embodiments a stack of single fold food service sheets. "Food service sheets" include bakery tissue, bakery sheets, deli sheets and sandwich wrap such as, e.g., Quilt-Rap® sandwich wrap, all of which are further described below. Generally speaking bakery sheets are paper which has been impregnated with wax or binder to make a relatively grease and moisture resistant substrate for handling of food products, for example. Such sheet is more resilient than facial tissue and requires the shrink wrap envelope for proper performance of the inventive system. The band **36** on the other hand is optionally included. The stack of inter-folded sheet is arranged in a U-shape such that their tail or dispensing edges **40** as shown in **Figures 5** and 7 for example are generally parallel to the surface of the dispensing region defined as shown by perforate line **38**. Bakery tissue is generally sized as 6" x 10¾" sheets, 8" x 10¾" sheets, 10" x 10¾" sheets, 12" x 10¾" sheets or 15" x 10¾" sheets such that their panels are roughly 5-3/8" in a direction transverse to their dispensing width in the various embodiments. Similarly, the dispenser of the present invention is also well adapted for dispensing of deli sheets which are generally similar to bakery sheets and bakery tissue except that deli sheets are generally a little heavier in basis weight, typically nominally in the range of from about 15 lbs. per 3000 square foot ream to about 23 lbs. per 3000 square foot ream, while bakery tissues and sheets are most usually in the range of 10 lbs.-14

lbs. per 3000 square foot ream. The dispenser of the present invention is also well suited to dispensing Quilt-Rap® sheets sometimes referred to here as sandwich wrap as are described in United States Patent No. 5,582,674 to *Patterson et al.* and United States Patent No. 5,128,182 to *Bunker et al.*, the disclosure of which is incorporated herein by reference.

Core **32** is sized with respect to the dispenser and sheets such that its edges engage support means which may be in the form of channels or slots **54, 56** formed in the sidewalls of the dispenser and preferably the edges of the core protrude around the U-shaped stack on three sides or edges thereof as is appreciated particularly from **Figures 2, 4** and **7.** Core **32** has two lateral edges **42, 44** a lower edge **46** and an upper edge **48**. Lateral edges **42, 44** preferably extend a lateral distance **50** away from the edge of stack **30** and the core extends a distance **52** below the stack in a direction generally perpendicular to the lateral stack edges. These edges of the cores are operable to secure cartridge **12** in the dispenser housing as is seen in **Figure 1**. That is to say, housing **11** is provided with a pair of lateral slots **54, 56** in sidewalls **20** and **18** as well as a lower slot **58** in base wall **28** to receive the protruding portions of the core of the inter-folded sheet cartridge as shown in **Figure 1** in order to secure the cartridge in place. Once secured in place the sheets can be withdrawn from the U-shaped stack by fracturing perforated line **38** and withdrawing the sheet as is shown in **Figure 5** by grasping their edge **40**. Note that the core as held in place vertically will support the stack even as it is depleted such that the sheets do not become difficult to access as the stack is depleted.

So also, the shrink wrap envelope holds the stack in place such that the stack does not dissipate into individual sheets and become difficult to grasp. That is to say, if the stack of inter-folded sheets slides apart, a sheet when withdrawn will not drag the tail of a subsequent sheet through the dispensing aperture so that it will be readily available to a user. Note that when placed in the slots **54, 56** formed in the sidewalls the cartridge is configured such that the perforate line **38**

is presented to the aperture **26** such that the perforate line **38** is generally along the axis of dispensing aperture **26** and the folds in the sheets are generally parallel to both the dispensing line **38** and the axis of dispensing aperture **26**. Other suitable supports for cartridge **12** may be internally projecting bosses in the dispenser interior that compress the stack slightly and engage the core to hold it in a vertical position in which cases the edges of the core and stack can essentially coincide.

There is shown in **Figure 6** a diagram illustrating a preferred configuration of dispenser aperture **26**. Aperture **26** extends over a length, **L**, which is generally the same length as the width (that is, length of tail **40**) of the inter-folded sheets dispensed therethrough. Aperture **26** has a slightly widened portion indicated at **27** at its central region as well as narrowed or restricted portions **29, 31** at its terminal portions as shown in the diagram. Portions **29, 31** are defined by inward projections **33, 35, 37, 39** of the dispenser lid to narrow the aperture width to a relatively small width, **W'**, relative to width, **W**, at **27**, for example, over a length, **L'**. Inasmuch as length **L** is generally equal to the dispensing width of the sheets in the stack, the sheets are held in a generally vertical posture by portions **29, 31** of aperture **26** because of the narrowed width, **W'**, of the terminal portions of the aperture over length, **L'**, thereof as is seen in **Figure 5**. That is to say, the narrowed terminal portions of the aperture operate to orient the tail generally vertically so that it is readily available for dispensing.

Thus, aperture **26** preferably is a longitudinally extending slot or oval substantially the same length as the width of the sheets to be dispensed which narrows significantly at its outermost extents so that projections **33, 35, 37, 39** will engage the next to be dispensed sheet and hold the next to be dispensed sheet in a generally vertical posture making it easier for the user to grasp and remove a sheet with one hand.

In some embodiments the inter-folded sheets are single fold sheets as shown schematically in **Figure 7** which is intended to show the procedure by

which the U-shaped stack **30** of inter-folded sheets are prepared and wrapped around a rectangular core **32** of cardboard.

A stack of inter-folded sheets **30** includes a plurality of single fold sheets **60, 62** and **64** for example, which are interleaved as is well known in the art. The stack is placed adjacent core **32** and folded over in a U-shape as is shown for example in **Figures 2, 3** and **4** and indicated schematically by arrows **66** and **68** in **Figure 6**. Other methods of inter-folding the sheet could likewise be employed for example, such as C-fold or Z-fold or multi-fold configurations as are also well known in the art. The single fold configuration is particularly advantageous for bakery tissue due to the frictional properties of the sheet, that is to say the relatively low inter-sheet friction.

Referring to **Figures 8** and **9**, there is shown another dispenser **110** configured in accordance with the present invention. Dispense **110** includes a front wall **114**, a back wall **116**, sidewalls **118** and **120** as well as a lid **122**. Lid **122** is secured to the back wall by way of hinges **124** and **124'** and has an aperture **126** on its apex.

Sidewall **118** has a slot **154** and sidewall **120** has a slot **156**. Slots **154** and **156** are defined by a pair of vertically projecting ribs which may be integrally formed with the sidewalls when the dispenser is made by way of injection molding, for example.

Dispenser **110** is sized to receive a cartridge having a length of 12" in slots **154** and **156**; however, any such suitable first length may be selected depending upon the product. These slots receive a cartridge with a 12" rectangular base, i.e., a cartridge of suitable length like that of **Figure 1** is disposed in slots **154, 156** in the same position as was shown in **Figure 1**. There are optionally provided guide ribs **170, 172** to position springs of the type described in connection with **Figure 10**.

The dispenser of **Figure 8** is adaptable to receive cartridges of second and third lengths by way of positioning one or more universal adapter plates of the type shown in **Figure 9**.

Adapter plate **180** includes front vertical slot **182** and rear slot **184** each defined by a pair of opposed vertical ribs such as ribs **186** and **188**. Plate **180** also includes wedge-shaped portions **190, 192** to help secure it in a slot as well as a cutaway **194** to accommodate features in the base. One or more of the adapter plates are used to configure dispenser **110** to receive a cartridge of second and third lengths.

There is shown in **Figure 8** two plates **180** disposed in intermediate slots **196, 198, 200** and **202**. In this configuration, the dispenser is adapted to receive a 10" cartridge. If a 12" cartridge is used instead, the adapter plates are simply removed.

Likewise, dispenser **110** can be configured to receive two 6" cartridges by including only one plate **180** in central support slots **204** and **206**. Thus, the universal adapter plates can be used to configure dispenser **110** to receive cartridges of three different lengths.

Additional features of the inventive dispenser include a central spring to facilitate product dispensing as the cartridge is consumed as well as low profile front and rear walls to facilitate replenishment. These features are discussed in connection with **Figure 10**.

In **Figure 10** there is shown another dispenser **210** having a front wall **214**, a back wall **216**, sidewalls **218, 220**, a lid **222**, hinges **224** and **224'** as well as a base wall **228**. A pair of vertical ribs defines vertical slots **254** and **256** as was discussed above in connection with **Figure 1** and following. In this case, slots **254** and **256** are spaced to accept a 6" cartridge.

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A salient feature of the dispenser configuration are low profile front and back walls wherein front wall **214** and back wall **216** have a height, **H**, which is less than the height, **H'**, of sidewalls **218, 220** as measured at the central portion. When the dispenser is open, the sidewalls are low enough so that they will not interfere with the hand of someone removing a spent cartridge or loading the dispenser with a fresh cartridge, while the sidewalls have an apex **225** which is high enough to provide adequate support for the cartridge. To this end, the height of the front wall is 1" or more lower than the height, **H'**, of the sidewall, typically 1¼" lower or more.

It is also desirable to include a spring **260** in the dispenser to urge a cartridge upwardly as sheets are removed; otherwise, sheets of the cartridge may be inaccessible from aperture **226** when the cartridge is partially depleted and before the cartridge is completely depleted.

To this end, spring **260** is provided with an arched central portion **262**, support tabs **264, 266** and a slotted end **270**. The spring may be secured by a bolt **272** or any other suitable means.

When a cartridge is in the dispenser, slot **270** preferably engages the core as do slots **254, 266** and tabs **266, 264** as well as the spring **260** generally. Spring **260** urges the cartridge upwardly to dispensing slot **226**, which is especially important as the cartridge is depleted. Preferably, the spring exerts an upward force on a cartridge placed into the dispenser of at least 50% or 75% of the weight of fresh cartridge and more preferably exerts an upward force of at least 100% of the weight of a fresh cartridge. A typical spring force is 0.8 lbs at the bottom of deflection.

The present invention also includes a method of dispensing sheet utilizing the inventive cartridge of inter-folded sheets as well as the cartridge themselves as will be appreciated from the foregoing discussion.

While the present invention has been illustrated in connection with various embodiments, modifications to specific embodiments within the spirit and scope of the present invention, set forth in the appended claims, will be readily apparent to those of skill in the art.